

CHIHUAHUA: Vicinity of Chihuahua, 1908, *Palmer 141*; 3 mi. west of Camargo, tree 8 m. tall, *White 2284*.

A species ranging from western New Mexico and Arizona south in Chihuahua and Sonora to Durango. It is closely related to the more easterly *J. microcarpa* but is usually separable by its arborescent habit, much larger nuts, and larger, proportionately broader, generally fewer, evidently short-petiolulate leaflets. The bases of the leaflets are strongly oblique, with one side of the blade decurrent on the petiolule for at least a millimeter. The curved more elongate leaflets of *J. microcarpa* are subsessile, with the blade decurrent only very obscurely if at all.

Juglans major var. *Stewartii* var. nov.

A varietate typica differt foliolis 15–21 angustioribus et longioribus 7–12 cm. longis 13–19 mm. latis supra basim latissimis deinde apicem versus gradatim longe attenuatis curvatis.

COAHUILA: Sierra Hechiceros, Cañon Indio Felipe, common along stream in deep watered canyon, tree becoming 45 ft. tall, Sept. 18, 1940, *Johnston & Muller 1358* (TYPE, Gray Herb.); Cañon Indio Felipe, banks of creek, tree 12 m. tall, common, *Stewart 134*.

A plant agreeing with the western *J. major* in its arborescent habit, large fruits, and oblique decurrent leaflet-bases, and resembling *J. microcarpa* in its numerous elongate leaflets.

BETULACEAE

Ostrya virginiana (Mill.) Koch, Dendr. 2²: 6 (1873).

COAHUILA: Sierra Gloria, July 1939, *Marsh 1878*.

A species of eastern United States that extends south into our area.

FAGACEAE

by CORNELIUS H. MULLER

Quercus Laceyi Small, Bull. Torr. Bot. Cl. 28: 358 (1901).

Quercus breviloba f. *Laceyi* Trel. Mem. Nat. Acad. 20: 102 (1924).

Quercus porphyrogenita Trel. Mem. Nat. Acad. 20: 51. t. 39 (1924); Muller, Am. Midl. Nat. 18: 844 (1937).

Quercus microlepis Trel. & Muell. in Mueller, Bull. Torr. Bot. Cl. 63: 150 (1936).

Quercus glaucophylla sensu Mueller, Bull. Torr. Bot. Cl. 63: 150 (1936); Jour. Arnold Arb. 17: 162 (1936); non von Seemen (1900).

VERNACULAR NAME: Encino.

COAHUILA: Sierra del Carmen, Cañon Sentenela, *Wynd & Mueller 541, 617*; Rancho Agua Dulce, wooded canyon, east slope of Sierra Manuel, *Wynd & Mueller 345, 346*; Hac. Mariposa, ravine near Puerto Santa Ana, *Wynd & Mueller 230*; Hac. Mariposa, Sierra del Puerto Santa Ana, *Wynd & Mueller 262*; Sorpresa Spring, *Marsh 335, 344*; Palm Canyon, *Marsh 368*; Sierra Gloria, *Marsh 1954, 1978, 2002, 2005*; north slope of Sierra del Oso, Bocatoche, shrub to tree 6–30 ft. tall, common on slopes and arroyo-banks, *Muller 3143*; northwest slopes of Sierra San Lazaro, *Wynd & Mueller 170*; San Lorenzo Canyon near Saltillo, Apr. 12, 1906, *Pringle 10228*; Hillcoat Mesa lying west of Encantada Ranch, July 25, 1938, *Marsh 1426, 1432*; west of Buena Vista Ranch, July 14, 1938, *Marsh 2291*; Cañon Milagro, Sierra Guajes, 12 km. west of Hac. Encantada, tree 6–7 m. tall, *Stewart 1507, 1708*; Cañon San Enrique, Sierra Encantada, 5 km. west of Rancho Buena Vista, tree 5 m. tall, fairly common on hillside at mouth

of canyon, *Stewart 1369*; Sierra del Pino, La Noria, sparse on arroyo-banks, becoming 15 ft. tall, *Johnston & Muller 522*; Sierra del Pino, pine forest north of La Noria, scattered along arroyos, up to 30 ft. tall, *Johnston & Muller 559*; Sierra del Pino, high ridge west of La Noria, north-facing slopes below crest, shrub or tree 6–15 ft. tall, common, *Johnston & Muller 616*; west side of Potrero de la Mula, common on escarpment, 10–15 ft. tall, *Johnston 9207*; Sierra Madera, Cañon Pajarito, abundant small to moderate tree along upper arroyo and on slopes, up to 30 ft. tall, *Muller 3192*; Sierra Madera, Cañon del Agua, abundant in oak-pinyon zone of lower canyon, becoming 20 ft. tall, *Muller 3267*; Sierra Madera, Cañon Charretera, common on flats near La Cueva, tree 20 ft. tall, *Johnston 8933*.

Edwards Plateau region of Texas south in the mountains of Coahuila and the Sierra Madre of Nuevo Leon into Tamaulipas and San Luis Potosi. A well marked but polymorphic species usually most common along waterways in limestone mountains. The white scaly bark, the blue-green cast of its somewhat glaucous and rounded-lobed leaves, and the prominently thickened cup-scales are distinguishing characters. Our plants are obviously conspecific with the Texan *Q. Laceyi*. That species, however, seems closely related to southern Mexican plants comprising *Quercus* series *Glaucoides* Trel. and may possibly be conspecific with one of the older species in that assemblage. Our plant, in fact, has been identified with *Q. glaucophylla* von Seemen, a species first described from Oaxaca. For the present, however, it seems best to maintain the northern plants as distinct and to defer any possible change in their status until the southern species can be given a critical study and their precise relations established.

Quercus oblongifolia Torr. in Sitgreaves, Rep. Exped. Zuni & Colorado Rivers 173 (1853).

VERNACULAR NAME: Encino.

COAHUILA: San Antonio de los Alamos, along creek in canyon, tree 30–50 ft. tall with gray scaly bark, trunk 1–2½ ft. thick, locally common, *Johnston & Muller 863, 865, 866, 867, 869, 870*. CHIHUAHUA: Pirámide, about bouldery rock-masses on gravelly plain, spreading tree 25–30 ft. tall with gray scaly bark, *Johnston & Muller 1425*; 7 mi. south of Pirámide, scattered trees on north slope of grassy hills, *Johnston & Muller 1429*.

Arizona south into Sonora and Chihuahua and with outlying eastern stations in our area. The species is superficially very similar to *Q. Laceyi* and at times the exact differences are difficult to describe. *Quercus oblongifolia*, however, has a decidedly westerly distribution, is usually found on igneous soils, and has leaves differing from those of *Q. Laceyi* in being thicker, grayer, and less prominently veined beneath.

Quercus filiformis Muller, Am. Midl. Nat. 27: 473 (1942).

COAHUILA: Sierra Madera, Cañon Pajarito, sprawling shrub 6–24 inches tall, scattered on rocky arroyo-banks in dense moist pine-oak-maple forest in upper canyon, *Muller 3150* (ISOTYPE).

This species is known only from the type collection. Its procumbent habit, very slender stems, and thin leaf-blades distinguish it from *Q. Pringlei*, the species to which it is probably most closely related. It occurs in densely wooded moist canyons at middle elevations.

Quercus Pringlei von Seemen, Bot. Jahrb. 29: 96 (1900).

VERNACULAR NAME: Encino.

COAHUILA: Mountains near Saltillo, 7000 ft., 1-2 m. tall, Apr. 12, 1906, *Pringle 10199*; mountains near Saltillo, 6500 ft., 2-3 ft. tall, Nov. 6, 1905, *Pringle 13609*; Carneros Pass, limestone hills, Sept. 1, 1889, *Pringle 2382*; Carneros Pass, limestone hills, shrub 2-3 ft. tall, May 10, 1891, *Pringle 3702* (ISOTYPE); arroyo 3 km. southwest of Fraile, *Stanford et al. 344*; Sierra del Pino, common bush along high ridge-crest west of La Noria, 4-7 ft. tall, *Johnston & Muller 600*; Sierra Madera, high crest of main ridge east of Picacho Zozaya, low scrub oak 1-2 ft. tall on rocky open crest, *Johnston 9018*; Sierra Madera, Cañon del Agua, common on steep wooded canyon slopes, shrub becoming 10 ft. tall, *Muller 3206, 3222*; Sierra Mojada, Cañon Hidalgo, open hillsides below crest, fairly common, 7-8 m. tall, *Stewart 1084*; Sierra Mojada, Cañon San Salvador, very abundant in upper canyon, becoming 15 ft. tall, bark scaly and gray, *Muller 3300, 3300a, 3300b*; summit of Picacho Jimulco, *Stanford et al. 91, 111*. ZACATECAS: Valley 15 km. west of Concepcion del Oro, tree 7 ft. tall, *Stanford et al. 551*.

Ranging in western and southern Coahuila and northern Zacatecas, and south in western Nuevo Leon to San Luis Potosi. The species is characterized by its small, usually glabrous leaves with thickish blades and acute apices. The undersurface is at times somewhat glaucous. This plant, usually a small dense bush, occurs in mesic or dry situations at moderate and high elevations.

Quercus sinuata Walt. var. *breviloba* (Torr.) Muller, comb. nov.

Quercus obtusifolia var.? *breviloba* Torr. Bot. Mex. Bound. 206 (1859).

Quercus annulata Buckl. Proc. Acad. Nat. Sci. Phila. 1860: 445 (1860), non Smith in Rees (1819), non Korthals (1839-42).

Quercus san sabeana Buckl. ex Young, Familiar Lessons in Botany 507 (1873).

Quercus breviloba Sargent, Gard. & Forest 8: 93 (1895); Muller, Am. Midl. Nat. 18: 849 (1937).

COAHUILA: Rancho Agua Dulce, lower slopes of Sierra San Manuel, *Wynd & Mueller 308, 309, 311*; Rancho Agua Dulce, wooded canyon on east slope of Sierra San Manuel, *Wynd & Mueller 342, 344*; Sorpresa Spring, *Marsh 336*; Bocatoche, north slope of Sierra del Oso, abundant on slopes, shrub becoming 12 ft. tall, *Muller 3140, 3141*.

Ranging from the Edwards Plateau and from the Big Bend area, Texas, south in the mountains of eastern Coahuila. It has been reported as far south as the vicinity of Monterrey and has been discovered recently in southeastern Presidio County, Texas (Mexican Canyon, just off Fresno Canyon, *Hinckley 2295*), and hence may be expected south of the Rio Grande in northeastern Chihuahua and northwestern Coahuila. Past writers have maintained our plant as specifically distinct from the eastern *Q. sinuata*, but this seems difficult to justify since intermediate forms arise wherever *Q. sinuata* is exposed to xeric conditions or *Q. breviloba* to mesic conditions.

Quercus Greggii (A. DC.) Trel. Contr. U. S. Nat. Herb. 23: 185 (1922), Mem. Nat. Acad. 20: 78. t. 109 (1924).

Quercus reticulata β *Greggii* A. DC. Prodr. 16²: 34 (1864).

Quercus Loeseneri Trel. Mem. Nat. Acad. 20: 79. t. 110 (1924).

VERNACULAR NAME: Encino.

COAHUILA: San Antonio de las Alanzanas, frequent, 30-40 ft. tall, Aug. 31, 1848, *Gregg 380* (ISOTYPE); mountains near Saltillo, 7000 ft., 4-6 ft. tall, Nov. 6, 1905, *Pringle 10120* (isotype of *Q. Loeseneri*); Sierra Madera, Cañon del Agua, shrub up to 12 ft. tall, dominant in chaparral on upper slopes and around peaks, *Muller 3239*;

Sierra Madera, Cañon del Agua, large shrub or tree up to 25 ft. tall, principal constituent of oak forest in moist densely wooded upper canyon, *Muller* 3233; Sierra Madera, Cañon del Agua, shrub or small tree up to 15 ft. tall, with thin gray scaly bark, common in open oak forests on steep canyon slopes, *Muller* 3207; Sierra Madera, common in moist shady coniferous forests on crest of high main ridge east of Picacho Zozaya, shrub 4–8 ft. tall, *Johnston* 9022, 9022a.

Mountains of central and southeastern Coahuila south in the Sierra Madre of Nuevo Leon to San Luis Potosi. A plant of moist canyons and forests in the high mountains.

Quercus Greggii f. *subglabra* Muller, f. nov.

A species recedit foliis subglabratiss non revolutis non crassis, venis supra vix impressis.

COAHUILA: Sierra Madera, Cañon del Agua, tree becoming 20 ft. tall, sparse along the moist densely wooded upper arroyos, Sept. 9, 1939, *Muller* 3238 (TYPE, Gray Herb.); Sierra Madera, Cañon del Agua, shrub or small tree up to 15 ft., sparse in moist pine oak forest on steep slopes, *Muller* 3227, 3227a.

This form differs conspicuously from typical *Q. Greggii* in having leaves with the lower face devoid of dense fulvous tomentum, the upper face with only weakly impressed veins, and the margins non-revolute. The naming of forms such as this is of doubtful value except when the variant may cause difficulty in delimiting the species. *Quercus Greggii* without its dense tomentum, its revolute leaf-margins, and its veins strongly impressed on the upper leaf-surface presents pronounced differences in aspect, and the relationship of this form to typical *Q. Greggii* might fail to be recognized by those who have not studied it in the field and have only herbarium material before them.

Quercus reticulata Humb. & Bonpl. Pl. Aequin. 2: 40. t. 86 (1809).

Quercus durangensis Trel. Mem. Nat. Acad. 20: 73. t. 91 (1924).

Quercus diversicolor Trel. Mem. Nat. Acad. 20: 73. t. 92–94 (1924); Muller, Am. Midl. Nat. 24: 708. fig. 3 (1940).

Quercus rhodophlebia Trel. Mem. Nat. Acad. 20: 74. t. 95–97 (1924).

COAHUILA: Sierra del Carmen, Sept. 12, 1936, *Marsh* 829; Sierra del Carmen, Cañon Sentenela, high slopes with northwest exposure, *Wynd & Mueller* 634, 636, 641.

Arizona, New Mexico, and trans-Pecos Texas and south along the Sierra Madre Occidental to central Mexico. Entering our area in northern Coahuila. The several species described by Trelease are obviously only forms of a very polymorphic species which recur throughout the range of the species regardless of geographical location. The typically obovate leaves mucronately toothed about the apex, the very prominent reticulum of the lower leaf-surface, and the long-stalked fruit with loose thin cup-scales very readily distinguish this species from others within our range.

Quercus pungens Liebm. Overs. Danske Vidensk. Forhandl. 1854: 171 (1854); Muller, Am. Midl. Nat. 24: 710. fig. 5 (1940).

Quercus undulata ♂ *Wrightii* Engelm. Trans. St. Louis Acad. 3: 382 (1876).

Quercus undulata var. *pungens* Engelm. Trans. St. Louis Acad. 3: 392 (1877).

VERNACULAR NAME: Encino.

COAHUILA: Sierra del Carmen, Sept. 2, 1936, *Marsh* 870; Bocatoche, north slope of Sierra del Oso, shrub to 12 ft., sparse on slopes, *Muller* 3142; escarpment on west side of Potrero de la Mula, lower and middle slopes, bush 8–12 ft. tall, *Johnston* 9197, 9206;

high ridge at west end of Sierra Fragua north of Puerto Colorado, a few shrubs about rocks on crest, 5–8 ft. tall, *Johnston 8766*; Puerto Colorado, deep ravines about summit of red sandstone cliffs, shrub becoming 12 ft. tall, *Johnston 8699, 8700*; Sierra del Pino, Dec. 1937, *LeSueur 1501*; Sierra del Pino, Cañon Ybarra, fairly common on arroyo-banks, shrub 2–4 m. tall, *Stewart 1810, 1811, 1812*; Sierra Planchada, Cañon Gringo, banks of dry arroyo in upper canyon, common, shrub 2–6 m. tall, *Stewart 1025, 1030*; Sierra Mojada, Cañon San Salvador, common in middle and upper canyons and arroyos, tree with scaly gray bark, becoming 12 ft. tall, *Muller 3299, 3299a*; west side Valle de Delicias, 3 km. southwest of La Botica, common tree on arroyo-banks, 8 m. tall, *Stewart 2863*; 11 km. northeast of Jimulco, 10–12 ft. tall, *Stanford et al. 64*. CHIHUAHUA: Hills between Alamos Chapado and Alamitos, canyon 18 mi. west of San Carlos, waif tree 6 ft. tall on canyon floor, *Johnston & Muller 26*; Sierra San Carlos, lower part of canyon along road to mines, basally branched shrub 6–12 ft. tall, *Johnston & Muller 50*; Rancho Madera, southeastern base of Sierra Rica, arroyo-banks, common shrub 4 m. tall, *Stewart 2484*; Sierra Almagre, deep moist shaded canyon, up to 30 ft. tall, *Johnston & Muller 1151*; Sierra Almagre, common along arroyos, shrub 6 ft. to tree 20 ft. tall, *Johnston & Muller 1166*; Sierra Diablo, Canyon Rayo, fairly common on arroyo-banks, shrub 4–6 m. tall, *Stewart 955*; Sierra Santa Eulalia, March 27 and Sept. 19, 1885, *Pringle 172, 353*; Sierra Santa Eulalia, El Poza, shrub 1 m. tall, *White 2421*.

Ranging from Arizona and New Mexico through trans-Pecos Texas and south in Chihuahua and Coahuila into Nuevo Leon and Tamaulipas, usually confined to dry limestone slopes and along arroyos at lower elevations in the mountains. The leaves have rough almost sandpaper-like surfaces, imparted by their sparse short stiff pubescence. The species may commonly be recognized by this character alone. Although our plant has been treated as a variety of *Q. undulata*, it is not closely related to that species. *Quercus undulata* is related to *Q. Gambelii*. *Quercus pungens* is related to neither of these two species. When *Q. undulata* and *Q. pungens* occur on the same mountain ranges, the former is confined to the very highest elevations, while the latter occupies the lower belt of woody vegetation, the two being separated by a belt of several thousand vertical feet in which neither occurs.

A few of the specimens here referred to *Q. pungens* were formerly treated as belonging to *Q. Vaseyana* Buckl. Material from Nuevo Leon (including the type of *Q. sillae* Trel.) belongs to *Q. Vaseyana*, but no collections truly belonging to that species are available from Coahuila or Chihuahua. However, the presence of the species near the Rio Grande, along the lower Pecos and Devils Rivers, and in the limestone country of the western Edwards Plateau, in Texas, makes it almost certain that *Q. Vaseyana* will be found in the similar country in adjoining northern Coahuila. *Quercus Vaseyana* and *Q. pungens* are very closely related and frequently rather difficult to distinguish, the most satisfactory differences being the presence of harsh pubescence on the leaves of *Q. pungens* and its absence on the generally less lobed leaves of *Q. Vaseyana*, cf. Muller, Am. Midl. Nat. 27: 712. fig. 6 (1940).

Quercus invaginata Trel. Mem. Nat. Acad. 20: 87. t. 137, 138 (1924).

Quercus invaginata f. *Purpusiana* Trel. Mem. Nat. Acad. 20: 87. t. 138 (1924).

VERNACULAR NAME: Encino.

COAHUILA: Hillcoat Canyon, west of Buena Vista Ranch, July 13, 1938, *Marsh*

1276; Hillcoat Mesa lying west of Encantada Ranch, July 25, 1938, *Marsh* 1419, 1419a, 1420, 1421, 1428; Sierra Gloria, 1939, *Marsh* 1953, 1955, 1974, 1997; Bocatoche, north slope of Sierra del Oso, shrub or small tree, 2–12 ft. tall, dominant on lower arroyo slopes and in canyons, *Muller* 3136, 3137, 3138, 3144; Sierra San Lazaro, Puerto San Lazaro, abundant in shrub zone on dry slopes, shrub 3–8 ft. tall, usually in clumps of 6–15 trunks up to 2 in. diameter, *Muller* 3066, 3067; San Lazaro, rocky slopes of Puerto San Lazaro, *Wynd & Mueller* 138, 139, 162; Sierra de la Paila, Oct. 1910, *Purpus* 5029 (ISOTYPE); Sierra de la Paila, Oct. 1910, *Purpus* 5030 (isotype of f. *Purpusiana*); western escarpment of Potrero de la Mula, large shrub 8–12 ft. tall, on middle slopes, *Johnston* 9210; Sierra San Vicente, Cañon Espantosa, about 20 km. southeast of Cuatro Cienegas, *Schroeder* 76, 98; Sierra del Pino, pine forest in middle of sierra north of La Noria, moist shaded arroyos, abundant, up to 30 ft. tall, *Johnston & Muller* 560; Sierra del Pino, vicinity of La Noria, on flats and adjacent open slopes, bush usually 3–6 but frequently 10 ft. tall, abundant, *Johnston & Muller* 439, 440, 520, 668, 710; Sierra del Pino, near mouth of main south canyon, sparse along arroyo, becoming 20 ft. tall, *Johnston & Muller* 378; west base of Picacho del Fuste, along arroyo in small canyon, *Johnston* 8457; tableland north of Cañon del Cuervo Chico, crest of low rounded limestone hill, rare, small tree 15 ft. tall, *Johnston* 8550; Sierra Madera, Cañon Charretera near La Cueva, rocky flat, element in oak chaparral, bush 4–6 ft., *Johnston* 8952; Sierra Madera, Cañon Charretera near La Cueva, rocky flats, tree 20–30 ft. tall, *Johnston* 8934; Sierra Madera, Cañon Charretera, coarse bush in lower canyon, 8–12 ft. tall, *Johnston* 9167, 9168; Sierra Madera, Cañon Pajarito, common in pinyon and shrub zones of lower canyon, shrubs or small trees, 10–20 ft. tall, *Muller* 3148, 3149, 3160, 3161; Sierra Cruces, Cañon Tinaja Blanca, common on north slopes low on canyon side, small tree 10–15 ft. tall, *Johnston & Muller* 300, 301, 302, 304; Cañon La Luz, 3 mi. south of San José, common tree in canyon, *Johnston & Muller* 1005, 1006; San Antonio de los Alamos, along creek in canyon, tree 30–50 ft. tall, trunk 1–2.5 ft. thick, bark gray and scaly, *Johnston & Muller* 864, 868, 871, 872.

Ranging in middle and western Coahuila, frequent at middle altitudes on the mountains and descending along arroyos to the foothills. The acorn-cups in the type material from Sierra de la Paila described by Trelease have loosely inrolled margins, which give them an inflated appearance. Such invaginate excessively inflated cups are common in the species but individual trees of one population, otherwise identical, may have cups variously inflated and some even indistinguishable from those of *Q. grisea*. As a matter of fact the present species is often very difficult to distinguish from *Q. grisea* in northwestern Coahuila, where the two species meet. However, the broad flat dentate leaf-blades of typical *Q. invaginata*, lacking the dense tomentum of *Q. grisea*, make the separation of the two species obligatory, especially since the similarities between them do not arise from any close genetic relationship.

Quercus intricata Trel. in Standl. Contr. U. S. Nat. Herb. 23: 185 (1922), Mem. Nat. Acad. 20: 84. t. 126–128 (1924); Muller, Am. Midl. Nat. 24: 710. fig. 4 (1940).

Quercus microphylla β *crispata* A. DC. Prodr. 16²: 36 (1864).

Quercus intricata f. *ovata* Trel. Mem. Nat. Acad. 20: 85. t. 128 (1924).

Quercus intricata f. *erratica* Trel. Mem. Nat. Acad. 20: 85. t. 128 (1924).

VERNACULAR NAMES: Encino; Charasquilla.

COAHUILA: Puerto San Lazaro, abundant on open slopes of Sierra San Lazaro, shrub 1–4 ft. tall, *Muller* 3085; Puerto San Lazaro, Sierra San Lazaro, sparsely scattered in the shrub zone, shrub to 2 ft. tall, much branched at base, *Muller* 3065; San Lazaro, rocky slopes of Puerto San Lazaro, *Wynd & Mueller* 163; Buena Vista, south of Saltillo, shrub-oak 2–5 ft. tall, abundant, July 24, 1848, *Gregg* 296 (ISOTYPE of *Q. microphylla* β *crispata* and *Q. intricata*); San Lorenzo Canyon, southeast of Saltillo,

canyon-sides, forming thick crowded clumps 3-5 ft. tall, 1904, *Palmer* 431; San Lorenzo Canyon, southeast of Saltillo, 1905, *Palmer* 552, 553, 554, 555, 556, 557, 745, 746 (isotype of *f. ovata*), 747, 748, 751; Carneros Pass, limestone hills, 2-3 ft. tall, May 10, 1891, *Pringle* 3701; Carneros Pass, 2 ft. high, Sept. 10, 1889, *Pringle* 2862; Sierra del Pino, 1937, *LeSueur* 1502; Sierra del Pino, Cañon Ybarra, fairly common on arroyo-banks, shrub 3 m. tall, *Stewart* 1861; Sierra del Pino, high western ridge near old log-slide, forming chaparral along rocky arid crest, 1-3 ft. tall, *Johnston & Muller* 565; Sierra del Pino, pine forests north of La Noria, abundant as scrub in open conifer forest, clumps 4 ft. tall, *Johnston & Muller* 561; Sierra del Pino, high ridge west of La Noria, abundant along crest and on adjacent slopes, *Johnston & Muller* 610; Sierra del Pino, vicinity of La Noria, clumps 2-4 ft. tall, *Johnston & Muller* 441, 442, 443, 444, 445; tableland north of Cañon del Cuervo Chico, forming thickets 3-6 ft. tall on low rounded limestone hills, *Johnston* 8551; Sierra Madera, scrub oak on high rocky open crest of main ridge east of Picacho Zozaya, 1-2 ft. tall, common, *Johnston* 9018a; Sierra Madera, Cañon Charretera near La Cueva, low bush 2-4 ft. tall on rocky flats, *Johnston* 8951; Sierra Madera, Cañon Pajarito, abundant on dry open slopes in upper arroyo, shrub 1-4 ft. tall, *Muller* 3191; Sierra Fragua, thickets 2-5 ft. tall with pines on eastern slopes of high ridge north of Puerto Colorado, *Johnston* 8779; Sierra Cruces, Cañon Tinaja Blanca, common on north slopes low down on canyon-side, shrub to 3 ft. tall, *Johnston & Muller* 299, 303; Sierra Cruces, foothills 3 mi. southeast of Santa Elena, sparse on arroyo-banks, 3 ft. tall, *Johnston & Muller* 1260; Sierra Mojada, Cañon San Salvador, crests, dominant shrub becoming 5 ft. tall, *Muller* 3310; Sierra de Parras, Apr. 1905, *Purpus* 1137; Sierra de Parras, *Shreve & Tinkham* 9876, 9888; Sierras Negras, south of Parras, tree 8-10 ft., *Stanford et al.* 147. CHIHUAHUA: Sierra Almagre, sparse in open rocky arroyo, becoming 5 ft. tall, *Johnston & Muller* 1182; Sierra Diablo, common about margins of meadows high on northwest end of sierra, 1-2 m. tall, *Stewart* 961. ZACATECAS: Cedros, 1908, *Lloyd* 130.

Ranging from trans-Pecos Texas (Davis and Chisos Mts.) south in Coahuila and adjacent Chihuahua and Zacatecas into Nuevo Leon. A xeric species characteristic of sunny slopes and flats and exposed dry ridges. It is commonly associated with *Q. invaginata* in central Coahuila and is one of the characteristic species in the Coahuilan oak-chaparral. The small revolute leaves with a dense buff tomentum beneath and the low habit of growth distinguish it.

Quercus arizonica Sargent, Gard. & Forest 8: 92 (1895).

Quercus Sacame Trel. Mem. Nat. Acad. 20: 89. t. 142 (1924).

Quercus endemica Muller, Am. Midl. Nat. 18: 846 (1937).

VERNACULAR NAME: Encino.

COAHUILA: Sierra del Carmen, Cañon Sentenela, *Wynd & Mueller* 540, 565, 638 (isotype of *Q. endemica*); Sierra Cruces, Cañon Encinal, 8 km. southwest of Santa Elena, frequent in shady canyon, deciduous tree becoming 12 m. tall, trunk 75 cm. thick, *Stewart* 2273, 2274; 10 km. southwest of Santa Elena, side of canyon, tree 8 m. tall, trunk 5 dm. thick, *Stewart* 1148. CHIHUAHUA: Sierra Organos, canyon west of Organos, large live oak, tree said to be only one of kind in region, *Stewart & Johnston* 2078. TEXAS: Chisos Mts., Boot Spring, *Mueller* 7936 (distributed as *Q. reticulata*).

Ranging from Arizona south in the highland of eastern Sonora and western Chihuahua into Durango and extending eastward in scattered stations into trans-Pecos Texas and Coahuila. The material from our area comes from the ragged eastern edges of the range of *Q. arizonica* where it is a rare relict, and its characters are so masked by aberrations characteristic of such edge-of-the-range individuals that the identity of some specimens has not been immediately evident. Though some plants from the Chisos Mts.,

formerly referred to *Q. endemica*, cf. Muller, Am. Midl. Nat. 24: 706 (1940), are probably best referred to *Q. grisea*, the Chisos specimen cited above, however, seems clearly to belong to *Q. arizonica*. *Quercus arizonica* is characterized by oblong to oblanceolate leaves with the reticulum very prominent beneath. It is distinguished from *Q. reticulata* by its more narrow leaves, its shorter fruiting peduncles, its thickened and tightly appressed cup-scales, and its occurrence at much lower and drier levels.

Quercus cordifolia Trel. Mem. Nat. Acad. 20: 84. t. 125 (1924).

Quercus striatula Trel. Mem. Nat. Acad. 20: 93. t. 151 (1924).

Quercus striatula f. *otinapensis* Trel. Mem. Nat. Acad. 20: 94. t. 152 (1924).

COAHUILA: Carneros Pass area, small tree 20 ft. tall, trunk up to 1 ft. thick, July 1880, *Palmer 1278* (GH, ISOTYPE); Carneros Pass area, 1880, *Palmer 1178* (AA).

Ranges from southern Coahuila into Durango, Zacatecas, and Nuevo Leon. Apparently most abundant in Nuevo Leon. This species is very polymorphic as to leaf-size and -shape and as to habit. It varies from a small tree with moderate-sized leaves, very similar to *Q. grisea*, to a diminutive shrub (3–6 ft. tall) with tiny leaves. Although *Q. cordifolia* is very similar to *Q. grisea* in one of its forms, it is by no means conspecific with that species. Unfortunately the type and other collections from the type locality are all of the large-leaved form. This form, however, is not separable from the diminutive form, there being many intermediates. *Quercus cordifolia* occurs at medium and high altitudes in the larger mountain masses and does not extend down into the shrub and small tree zones as does *Q. grisea* so commonly further north.

Quercus grisea Liebm. Overs. Danske Vidensk. Forhandl. 1854: 171 (1854); Muller, Am. Midl. Nat. 24: 706. fig. 1 (1940).

Quercus undulata var. *grisea* Engelm. Trans. St. Louis Acad. 3: 393 (1877).

Quercus santaclarensis Muller, Am. Midl. Nat. 19: 583 (1938).

VERNACULAR NAME: Encino.

COAHUILA: Sierra del Carmen, Sept. 6–12, 1936, *Marsh 832, 854*; western slopes of Sierra del Carmen, 8 km. northeast of Hac. Encantada, fairly common on hillsides, tree 5–6 m. tall, *Stewart 1552*; Sierra del Pino, abundant in dense pine forests in middle sections of sierra north of La Noria, tree 45 ft. tall, *Johnston & Muller 572*; Sierra del Pino, La Noria, common along arroyo, becoming 20 ft. tall, *Johnston & Muller 521*; Sierra Hechiceros, Cañon Indio Felipe, spreading tree, becoming 25–30 ft. tall, *Johnston & Muller 1341, 1342*; Sierra Hechiceros, Cañon Indio Felipe, along creek and on hillsides, becoming 15 m. tall, *Stewart 167, 182*; Sierra Hechiceros, Cañon Madera, canyon-bottoms and flats, becoming spreading tree 25–30 ft. tall, *Johnston & Muller 1284, 1285, 1289, 1293*; foothills of Sierra Cruces, along arroyo 2 mi. east of Santa Elena, clumps 10 ft. tall, *Johnston & Muller 798*; Sierra Cruces foothills, Boquilla east of Santa Elena, small colony along arroyo-bank, shrub 3–4 m. tall, *Stewart 2269*. CHIHUAHUA: Sierra Rica, Cañon Madera, open slopes and arroyo-banks, abundant tree 5 m. tall, trunk 4 dm. thick, *Stewart 2463, 2548*; 1½ mi. west of Tepopote, tree along arroyo, 35 ft. tall, *Johnston & Muller 1397*; 1 mi. west of San Salvador, large trees along arroyo, becoming 35 ft. tall, trunk 18 inches thick, *Johnston & Muller 1398, 1399*; about bouldery hills on gravelly plain west of Pirámide, common tree 25–30 ft. tall, *Johnston & Muller 1422, 1423, 1424*; 7 mi. south of Pirámide, tree on north slope of grassy hills, 20–25 ft. tall, *Johnston & Muller 1428, 1429*; canyon north of Mesteñas, broad spreading tree 20–25 ft. tall, common on flats and slopes, *Johnston 7955*.

Ranging from Arizona east to trans-Pecos Texas and south into northern

Mexico. Characterized by a combination of furrowed gray bark, dingy gray pubescent leaf-blades oblong to ovate in outline, and usually short-stalked fruit. In eastern Coahuila at times difficult to distinguish from *Q. Mohriana*. Frequently distinguished with difficulty from *Q. invaginata* and *Q. subcordata* of eastern Coahuila and of central and southern Coahuila.

Quercus chihuahuensis Trel. Mem. Nat. Acad. 20: 85. t. 129, 130 (1924).

Quercus undata Trel. Mem. Nat. Acad. 20: 86. t. 135 (1924).

VERNACULAR NAME: Encino.

CHIHUAHUA: Sierra Organos, large live-oak, 5 m. tall, common on slopes and along arroyos near Organos, *Stewart & Johnston 2068*; rocky hills near Chihuahua, May 8 and Oct., 1885, *Pringle 74, 355* (ISOTYPE).

Ranging along the Sierra Madre in Chihuahua and Sonora south to Durango and Sinaloa and extending eastward into our area. Trelease, l. c., reports a collection (*Pringle 970*) from the Mapula Mts. The species is characterized by its dense covering of long buff-colored pubescence on leaves and twigs. It is rather closely related to *Q. grisea* but is readily distinguished by its soft almost felt-like indument.

Quercus Mohriana Buckl. ex Rydb. Bull. N. Y. Bot. Gard. 2: 219. t. 31 (1901), exclusive of Mexican specimens cited, which are *Q. intricata* Trel.

VERNACULAR NAME: Encino.

COAHUILA: Rancho Agua Dulce, lower slopes of Sierra San Manuel, *Wynd & Mueller 306, 307*; Santo Domingo, open slope of igneous hill, *Wynd & Mueller 483*; Santo Domingo, limestone hill, *Wynd & Mueller 451*; Palm Canyon, *Marsh 373*; ravines near Puerto Santa Ana, *Wynd & Mueller 232, 233*; Hillcoat Mesa lying west of Encantada Ranch, July 25, 1938, *Marsh 1427, 1431*; Hillcoat Canyon, west of Buena Vista Ranch, July 13, 1938, *Marsh 1295, 1296*; high mesa in the Sierra Encantada about 16 km. northwest of Rancho Buena Vista, common on rocky hillside, shrub 15 dm. tall, *Stewart 1442*; Valle de los Guajes, 10 km. south of Rancho Buena Vista, common on grassy hillside, shrub 2-3 m. tall, *Stewart 1357*; El Berrendo, shrub or small tree, *White 1798, 1858*.

Ranging in Texas from the western Edwards Plateau and The Breaks of the Plains west to the Glass Mts. and south in the trans-Pecos area into northeastern Coahuila. It is characterized by having its oblong leaves rather dark green above and creamy white with dense tomentum beneath, cf. Muller, Am. Midl. Nat. 24: 708. fig. 2 (1940). In Coahuila a variety of shade forms are confusing because of their expanded leaves with light tomentum, but even in these the dual coloration is constant, as are also the more fundamental characters of the species.

Quercus undulata Torr. Ann. Lyceum N. Y. 2: 248. t. 4 (1828).

Quercus Fendleri Liebm. Overs. Danske Vidensk. Forhandl. 1854: 170 (1854).

Quercus undulata γ *pedunculata* A. DC. Prodr. 16²: 23 (1864).

Quercus undulata β *obtusifolia* A. DC. Prodr. 16²: 23 (1864).

Quercus venustula Greene, Ill. West Amer. Oaks 69. t. 32 (1890).

Quercus obtusifolia Rydb. Bull. N. Y. Bot. Gard. 2: 213. t. 29 (1901), non Don (1825).

Quercus Rydbergiana Cockerell, Torreya 3: 7 (1903).

Quercus undulata Rydbergiana Cockerell, Torreya 3: 86 (1903).

Quercus confusa Woot. & Standl. Contr. U. S. Nat. Herb. 16: 116 (1913).

Quercus media Woot. & Standl. Contr. U. S. Nat. Herb. 16: 116 (1913).

Quercus subobtusifolia A. Camus, Bull. Soc. Bot. France 81: 816 (1934).

Quercus carmenensis Muller, Am. Midl. Nat. 18: 847 (1937).

COAHUILA: Sierra del Carmen, Cañon Sentenela, high slopes with northwest exposure, Wynd & Mueller 633, 635, 639 (isotype of *Q. carmenensis*).

Ranging from Arizona and Colorado through New Mexico and trans-Pecos Texas into northern Coahuila. There is a possibility that eventually it may be found in the higher mountains of Chihuahua. The species has been variously interpreted and has been one of the most problematic in the southwestern United States and adjacent Mexico. The type collection resembles a form of *Q. grisea* and even looks a bit like *Q. pungens*. Growing in the same locality and radiating out over the entire range of the species are a dozen or more forms of it, some of which have been described as distinct species. The fact that the type collection came from a form of the species characteristic of xeric sites at lower elevations has caused it to be confused with *Q. grisea* and *Q. pungens* and has obscured its true relationships with *Q. Gambelii*. A study of many populations of this variable species in the field (including the type locality) has shown clearly that the form illustrated as *Q. venustula* by Greene is the most common form. It represents a form morphologically about midway between *Q. Gambelii* and the type of *Q. undulata*. *Quercus obtusifolia* is a form of *Q. undulata* even nearer to *Q. Gambelii* than *Q. venustula*. *Quercus carmenensis*, on the other hand, is an even more extreme variant in another direction. A thoroughly conservative treatment permits the recognition of both *Q. Gambelii* and *Q. undulata*, for the two assemblages involved show definite genetic differences; they often occur intermingled in the same habitat without intermediate forms. The narrow shallowly lobed leaves and obligate shrub-habit of *Q. undulata* and its tendency to frequent open drier and lower sites readily distinguish it from the arboreal (sometimes shrubby) *Q. Gambelii*, with its broad deeply lobed leaves.

Quercus Gambelii Nutt. Jour. Acad. Nat. Sci. Phila. n. s. 1: 179 (1848).

Quercus alba β ? *Gunnisonii* Torr. Pac. R. R. Rep. 21: 130 (1855).

Quercus stellata δ *Utahensis* A. DC. Prodr. 162: 22 (1864).

Quercus Douglasii β *Gambelii* A. DC. Prodr. 162: 23 (1864).

Quercus Douglasii γ *Novomexicana* A. DC. Prodr. 162: 24 (1864).

Quercus undulata var. *Gambelii* Engelm. Trans. St. Louis Acad. 3: 382, 392 (1876-77).

Quercus utahensis Rydb. Bull. N. Y. Bot. Gard. 2: 202. t. 25 (1901).

Quercus submollis Rydb. Bull. N. Y. Bot. Gard. 2: 202. t. 25 (1901).

Quercus Vreelandii Rydb. Bull. N. Y. Bot. Gard. 2: 204. t. 26 (1901).

Quercus leptophylla Rydb. Bull. N. Y. Bot. Gard. 2: 205. t. 26 (1901).

Quercus Gunnisonii Rydb. Bull. N. Y. Bot. Gard. 2: 206. t. 25 (1901).

Quercus nitescens Rydb. Bull. N. Y. Bot. Gard. 2: 207. t. 27 (1901).

Quercus novomexicana Rydb. Bull. N. Y. Bot. Gard. 2: 208. t. 27 (1901).

Quercus Eastwoodiae Rydb. Bull. N. Y. Bot. Gard. 2: 210. t. 28 (1901).

Quercus pauciloba Rydb. Bull. N. Y. Bot. Gard. 2: 215. t. 30 (1901).

Quercus utahensis var. *submollis* Sargent, Bot. Gaz. 65: 442 (1918).

Quercus Marshii Muller, Am. Midl. Nat. 18: 848 (1937).

COAHUILA: Sierra del Carmen, Sept. 12, 1933, Marsh 823; Sierra del Carmen, Cañon Sentenela, high slope with northwest exposure, Wynd & Mueller 640 (isotype of *Q. Marshii*).

Ranging from South Dakota to Nevada and south into Coahuila and Chihuahua. A species fully as polymorphic as *Q. undulata*, as its list of synonyms attests. Nomenclatorial recognition for the various forms of *Q. Gambelii* seems impractical, for they occur haphazardly throughout the range of the species and are always connected by intermediates. In the southern part of its range *Q. Gambelii* is confined to very high mesic elevations, being particularly common about talus slopes.

Quercus Muehlenbergii Engelm. Trans. St. Louis Acad. 3: 391 (1877).

Quercus Prinus (acuminata) Michx. Hist. Chênes Amer. Sept. (20). t. 8 (1801).

Quercus castanea Mühl., Neue Schr. Ges. Naturf. Fr. Berlin 3: 396 (1801), non Nees (1801, earlier in the year).

Quercus castanea var. *macrophylla* Hampton, Report Ohio State For. Bur. 1: 195 (1886).

Quercus acuminata Sargent, Gard. & Forest 8: 93 (1895).

Quercus Brayii Small, Bull. Torr. Bot. Cl. 28: 558 (1901); Muller, Am. Midl. Nat. 24: 714. fig. 8 (1940).

Quercus Muehlenbergii var. *Brayii* Sargent, Bot. Gaz. 65: 442 (1918).

Quercus sentenelensis Muller, Am. Midl. Nat. 18: 849 (1937).

COAHUILA: Sierra del Carmen, Cañon Sentenela, Wynd & Mueller 629 (isotype of *Q. sentenelensis*); Rancho Agua Dulce, wooded canyon on east slope of Sierra San Manuel, Wynd & Mueller 347; Sierra Gloria, Marsh 1905.

Ranging from the Atlantic region of the United States through central and western Texas (locally) and south in eastern Coahuila into Nuevo Leon. The differences between *Q. sentenelensis* and other forms of *Q. Muehlenbergii* have not proved constant. In fact, any division of the species seems doomed to failure, even though wide differences exist within the species as here accepted. These differences, however, are poorly if at all correlated with geography and with one another. *Quercus Muehlenbergii* is the only member of the series *Prinoides* (Chestnut Oaks) in our range, and its distinction from other species by its evenly repand-toothed leaves, broadly lanceolate to obovate in outline, is readily evident. In our range it is confined to moist stream banks in mesic mountains.

Quercus fusiformis Small, Bull. Torr. Bot. Cl. 28: 357 (1901); Muller, Am. Midl. Nat. 24: 718. fig. 10 (1940).

Quercus virginiana var. *fusiformis* Sargent, Bot. Gaz. 65: 448 (1918).

COAHUILA: Highway between Muzquiz and Hac. Mariposa, Wynd & Mueller 285; Santa Anna Canyon, Marsh 518; Monclova, 1880, Palmer 1274; Saltillo, single clump, base of hill, 6-8 ft. tall, 1898, Palmer 299.

Edwards Plateau, Texas, south into eastern Coahuila, northern Tamaulipas, and Nuevo Leon. In southern Tamaulipas and Nuevo Leon *Q. fusiformis* gives way to *Q. oleoides* without intermediates. On the eastern escarpments of the Edwards Plateau, in Texas, some intermediates occur connecting *Q. fusiformis* and *Q. virginiana* Mill. This transition between *Q. fusiformis* and *Q. virginiana* is not so pronounced and so complete as between *Q. sinuata* var. *breviloba* and *Q. sinuata* and a comparable reduction of *Q. fusiformis* to varietal rank under *Q. virginiana* does not seem to be required. The species occurs on dry limestone slopes and flats and along streams.

Quercus Emoryi Torr. in Emory, Notes Mil. Recon. 151. t. 9 (1848); Muller, Am. Midl. Nat. 24: 718. fig. 11 (1940).

Quercus hastata Liebm. Overs. Danske Vidensk. Forhandl. 1854: 171 (1854).

Quercus Duraznillo Trel. Mem. Nat. Acad. 20: 122. t. 220, 221 (1924).

Quercus balsequillana Trel. Mem. Nat. Acad. 20: 123. t. 220 (1924).

Ranging from Arizona east to trans-Pecos Texas and south along the Sierra Madre in Chihuahua and Sonora. Trelease, Mem. Nat. Acad. 20: 121 (1924), reports the species from the "vicinity of Chihuahua (*Palmer* 359)." The apparent absence of this species in Coahuila and eastern Chihuahua is puzzling, for it is abundant in the Chisos Mts. in adjacent Texas, and its common associates in the Chisos, *Q. grisea* and *Q. pungens*, range well south into our area. The small commonly hastate leaves of this species, usually glabrous except for tufts of hair on the lower surface of the blade along the base of the midrib, and its small annual fruits adequately distinguish *Q. Emoryi* from other species of the subgenus *Erythrobalanus* in our area. It is most commonly found on grassy igneous slopes and along waterways in igneous mountains at low elevations.

Quercus saltillensis Trel. Mem. Nat. Acad. 20: 183. t. 368, 369 (1924).

Quercus carnerosana Trel. Mem. Nat. Acad. 20: 183. t. 369 (1924).

COAHUILA: San Lorenzo Canyon near Saltillo, April 12, 1906, *Pringle* 10229; Carneros Pass area, up to 30-40 ft. tall, March 1880, *Palmer* 1277 (TYPE); Carneros Pass, mountains, Sept. 15, 1889, *Pringle* 2802 (isotype of *Q. carnerosana*); Sierra Negras, south of Parras, *Stanford et al.* 145.

Ranging in southern Coahuila and in the Sierra Madre of Nuevo Leon. This shrub is characterized by its annual fruition and by small lanceolate leaves, usually glabrous and entire, or sparsely pubescent beneath and toothed. It is commonly encountered on dry limestone slopes at moderate elevations.

Quercus hypoleucoides A. Camus, Bull. Mus. Hist. Nat. II. 4: 124 (1932); Muller, Am. Midl. Nat. 24: 721. fig. 13 (1940).

Quercus confertifolia Torr. Bot. Mex. Bound. 207 (1840), non Humb. & Bonpl. (1809).

Quercus hypoleuca Engelm. Trans. St. Louis Acad. 3: 384 (1876), non Miquel (1855).

COAHUILA: Sierra del Carmen, Sept. 12, 1936, *Marsh* 831; Sierra del Carmen, Cañon Sentenela, *Wynd & Mueller* 533, 564, 637. CHIHUAHUA: Peña Fea near Chihuahua, *LeSueur* 530.

Ranging from trans-Pecos Texas to Arizona and south into northern Coahuila and along the Sierra Madre in Chihuahua and Sonora. The characteristically narrowly lanceolate leaves, dark green above and densely white-tomentose beneath, distinguish this species. It occurs on moist slopes and along waterways at high elevations.

Quercus hypoxantha Trel. Mem. Nat. Acad. 20: 170. t. 339 (1924).

Quercus errans f. *graciliramis* Mueller, Jour. Arnold Arb. 17: 169 (1936).

VERNACULAR NAME: Encino.

COAHUILA: Mountains near Saltillo, small tree, 7000 ft. alt., Apr. 12, 1906, *Pringle* 10227 (TYPE); 26 km. northwest of Fraile, top of mountain with *Abies*, *Pseudotsuga* and *Pinus*, *Stanford et al.* 440; Sierra del Pino, middle of sierra about 10 mi. north of La Noria, scattered in open pine forests and in chaparral on adjacent slopes below ridge-crest, several erect or ascending stems, 4-8 ft. tall, *Johnston & Muller* 566, 567;

Sierra Madera, Cañon del Agua, tree common in moist upper canyons, up to 25 ft. tall, trunk to 10 inches thick, *Muller* 3232; Sierra Madera, Cañon del Agua, shrub or small tree with hard black checkered bark on branches, abundant in dense oak chaparral on steep slopes at 8000 ft., up to 20 ft. tall, trunks becoming 3 in. thick, *Muller* 3213; Sierra Madera, Cañon del Agua, shrub or small tree, to 20 ft. tall, trunk 3 in. thick, dense pine-oak forest, *Muller* 3214; Sierra Madera, high crest of main ridge east of Picacho Zozaya, open forests, common, shrub 5-8 ft. tall, *Johnston* 9021; Sierra Madera, Cañon Charretera, lower parts of conifer-forests, tree or shrub 8-10 ft. tall, *Johnston* 9054. CHIHUAHUA: Sierra Diablo, 12-14 km. up Cañon Rayo, common on banks of dry arroyo, shrub 5-8 m., *Stewart* 921, 921a, 924; 15 km. up Cañon Rayo, Sierra Diablo, common tree on dry hillside, 10 m. tall, *Stewart* 931.

Ranging from southeastern Chihuahua eastward in the higher mountains of central and southern Coahuila into Nuevo Leon. It occurs usually at high elevations in relatively dry mountains. The species is distinguished by its biennial fruition and its coarsely dentate coriaceous leaves with strongly revolute margins and densely fulvous-tomentose lower surfaces.

Quercus Gravesii Sudw. U. S. Dept. Agric. Misc. Cir. 92: 86 (1927); Muller, Am. Midl. Nat. 24: 724. fig. 16 (1940).

Quercus coccinea var. *?microcarpa* Torr. Bot. Mex. Bound. 206 (1859).

Quercus texana var. *chesosensis* Sargent, Bot. Gaz. 65: 423 (1918).

Quercus texana var. *stellipila* Sargent, Bot. Gaz. 65: 424 (1918).

Quercus stellipila Parks in Cory, Rhodora 38: 405 (1936).

Quercus chesosensis Muller, Am. Midl. Nat. 18: 850 (1937).

VERNACULAR NAMES: Encino colorado; Encino.

COAHUILA: Sierra del Carmen, Aug. 26, 1936, *Marsh* 591; Jardin del Sur, Sept. 3, 1936, *Marsh* 768; Sierra del Carmen, Cañon Sentenela, *Wynd & Mueller* 534, 600, 608, 651; near Piedra Blanca, igneous hills, *Wynd & Mueller* 500; open country between Santo Domingo and Piedra Blanca, *Wynd & Mueller* 493; Rancho Agua Dulce, Sierra San Manuel, *Wynd & Mueller* 234, 330, 383; ravines near Puerto Santa Ana, *Wynd & Mueller* 234; Palm Canyon, *Marsh* 369; Sorpresa Spring, *Marsh* 337; Sierra Gloria, *Marsh* 1965, 2001; Bocatoche, north slope of Sierra del Oso, abundant along arroyo and scattered on slopes, moderate tree up to 30 ft. tall with hard furrowed gray bark and on upper limbs bark in flat plates, *Muller* 3135; Puerto San Lazaro, Sierra San Lazaro, small to moderate tree to 25 ft. tall, trunk 1 ft. thick, abundant on talus slopes, *Muller* 3086, 3087; northwest slopes of Sierra San Lazaro, *Wynd & Mueller* 167, 168, 171; Hillcoat Canyon west of Buena Vista, July 13, 1938, *Marsh* 1275, 1297; Hillcoat Mesa lying west of Encantada Ranch, July 25, 1938, *Marsh* 1429; Cañon San Enrique, eastern side of Sierra Encantada west of Rancho Buena Vista, common on hillsides, shrub up to 4 m. tall, *Stewart* 1392, 1403; Sierra del Pino, La Noria, common along arroyos, in clumps with 10-20 small trunks from one root, 10-15 ft. tall, *Johnston & Muller* 438; Sierra del Pino, central parts of sierra north of La Noria, dense pine forests and along arroyos, becoming 40 ft. tall, trunk 18 inches thick, *Johnston & Muller* 558; Sierra del Pino, Cañon Ybarra, fairly common on arroyo-banks, tree 5 m. tall, *Stewart* 1868; escarpment on west side of Potrero de la Mula, common tree on middle slopes, 10-20 ft. tall, *Johnston* 9209; Sierra Madera, Cañon Charretera, common tree or large shrub on flats and along arroyos below conifer forests, 20-25 ft. tall, *Johnston* 8922; Sierra Madera, Cañon Charrereta, the common large oak along canyons in the lower parts of the conifer forests, tree 30-40 ft. tall, *Johnston* 9045; Sierra Madera, Cañon Pajarito, abundant constituent of upper arroyo forests, tree to 30 ft. tall, trunk 1 ft. thick, *Muller* 3172.

Ranging from the Davis Mts. in trans-Pecos Texas south to central Coahuila. Until 1936 the species was known only from Texas, but its distribution and abundance in Coahuila are greater than north of the Rio Grande. The deeply incised leaves, with scant pubescence except in the

axils of the veins beneath, and the scarlet color of the foliage in the autumn are very suggestive of *Q. texana* Buckl. and *Q. coccinea* Muench. These characters amply distinguish the species from all others in our range. It is common and conspicuous in mesic forests in canyons in both limestone and igneous mountains.

In addition to the twenty-four species listed above, a number of other species probably occur in our area and may be expected about its margins. A large number of oaks are characteristic of the mountains of Nuevo Leon and of the highlands of western Chihuahua and Durango, and some of them are no doubt present in the poorly botanized mountains of southeastern Coahuila and on the hills and mountains along our western border. Trelease has described and illustrated many of these species in his monograph. Notes and descriptions of additional species of this flora have been published by Muller, Jour. Arnold Arb. 17: 160–179 (1936) and Am. Midl. Nat. 27: 470–490 (1942). Among the oaks of western Texas, illustrated, described, and discussed by Muller, Am. Midl. Nat. 24: 703–728 (1940), there are five species which may be expected in northern Coahuila and Chihuahua: *Q. Vaseyana*, *Q. turbinella*, *Q. Tharpii*, *Q. graciliformis*, and *Q. robusta*. The three last-named are known only from the Chisos Mts.

ULMACEAE

Ulmus multinervosa Muller, Am. Midl. Nat. 18: 842 (1937).

COAHUILA: Rancho Agua Dulce, wooded canyon on eastern slope of Sierra San Manuel, small or moderate-sized tree up to 15 m. tall, *Wynd & Mueller* 338 (ISOTYPE).

This species of elm is known only from the type locality. It is closely related to *U. divaricata* Mueller of the Sierra Madre south of Monterrey.

In the Sierra Madera, in central Coahuila, just west of Hacienda del Sierra Madera, there is a canyon called "Cañon del Ulmo." I have been informed by local people that the tree giving the canyon its name is not known to grow elsewhere in the region centering about Ocampo. It may possibly represent *U. multinervosa*.

Celtis pallida Torr. Bot. Mex. Bound. 203 (1859).

VERNACULAR NAMES: Granjeno; Acebuche.

COAHUILA: Allende, *Marsh* 1807; 11 mi. south of Allende, *Johnston* 7014; Hac. Mariposa, *Wynd* 671; Rancho Babia, *Marsh* 1202; Santa Anna Canyon, *Marsh* 468; Muzquiz, *Marsh* 2106; Monclova, *White* 1752; San Francisco, about 50 mi. south of Monclova, *Wynd & Mueller* 95; Cuatro Cienegas, *White* 1880; 9 mi. northwest of El Oro, road to Sierra Mojada, *White* 1978; 11 km. northeast of Jimulco, *Stanford et al.* 83a. CHIHUAHUA: Near Lake Santa Maria, 1899, *Nelson* 6427; near Chihuahua, 1908, *Palmer* 113; Meoqui, 1936, *LeSueur* 597; near Ojito, 1847, *Gregg*; Ojo de San Bernardo, 1847, *Gregg*.

A dense bush 2–4 m. tall, with stiff intricate spinescent branches, which is common in rocky soil, especially along arroyos and on the higher slopes of broad valleys. The small orange-colored drupes are edible. The species ranges from south-central Texas to southern Arizona and south in the arid parts of Mexico to Oaxaca, and from southern Florida south in the drier